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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|----------------------|
| 10/686,704 | 10/17/2003 | Hisaki Kurashina | 117086 | 8807 |
| 25944 | 7590 | 06/28/2006 | EXAMINER | |
| OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320 | | | | NGUYEN, THANH NHAN P |
| ART UNIT | | PAPER NUMBER | | |
| | | 2871 | | |

DATE MAILED: 06/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/686,704 | KURASHINA ET AL. | |
| | Examiner | Art Unit | |
| | (Nancy) Thanh-Nhan P. Nguyen | 2871 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 07 April 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-13 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-13 and 15-17 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 17 October 2003 is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/24/2006.
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____.

DETAILED ACTION

This communication is responsive to RCE dated 4/7/2006.

Claims 1-13 and 15-17 are pending for the examination.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 4 and 7 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

First, claim 1 recites "a filler formed of the same material as the pixel electrode and having a substantially planar upper surface." Further, the specification discloses the pixel electrode is made of the transparent conductive material, such as ITO and IZO, [par. 0041].

Claim 4 recites that "the filler being made of a light-shielding material", and claim 7 recites that "the filler being made of a polyimide material", which will be interpreted as the pixel electrode being made of light-shielding material (as in claim 4), and the pixel electrode being made of polyimide material (as in claim 7). These limitations/features are not supported in the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5, 6, 8-13 and 15-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato (U.S. 2002/0018278) in view of Yang (U.S. 5,429,962) and Zhang et al (US 6,396,470).

Regarding claims 1, 5, 9, 10 and 17, Sato discloses an electro-optical device comprising, above a substrate (10): a data line (6a') extending in a first direction; a scanning line (3a) extending in a second direction and intersecting the data line; a pixel electrode (9a) and switching element (30) disposed so as to correspond to an intersection region of the data line and the scanning line; a storage capacitor (70') electrically connected to the thin film transistor and the pixel electrode; a light shielding layer (300') disposed between the data line and the pixel electrode; an interlayer insulating film (43) disposed as the base of the pixel electrode; and a contact hole (85) formed in the interlayer insulating film, to electrically connect the switching element to the pixel electrode; the entire region inside the contact holes being filled with a filler (16); and a relay layer (71a') formed below the interlayer insulating film and electrically connecting the pixel electrode to the switching element, [figs. 1, 3, 17].

Sato lacks discloses the relay layer having a two-layered structure including two metal layers; wherein one of the metal layers of the relay layer being formed from a

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light-absorbing material and the other of the metal layers being formed from a light-reflecting material; and further lacks discloses the data line being formed of the same film as one of a pair of electrodes constituting the storage capacitor; wherein the data line being a laminated structure of an aluminum film and a conductive polysilicon film .

It was well known to have a layer (relay layer/data layer) formed of a two-layered structure including two metal layers as for preventing breakage of the layer as evidenced by Yang [col. 3, lines 66-68; col. 4, lines 1-16 & lines 37-42]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the relay layer or/and the data line formed of a two-layered structure including two metal layers as for preventing breakage of the layer. Further, the data line being formed of the same film as one of a pair of electrodes constituting the storage capacitor achieves advantages such as cost reduction, product yield, as a common goal in the art, and the relay layer being formed from a light-absorbing material and the other of the metal layers being formed from a light-reflecting material as two-layered structure data line material would have been achieved the same advantages.

Sato further lacks disclosure of the filler formed of the same material as the pixel electrode or transparent conductive material, and having a substantially planar upper surface.

Zhang et al discloses the filler formed of transparent conductive material or the same material as the pixel electrode, and having a substantially planar upper surface, [fig. 16, the same material of pixel electrode (45) filled the contact hole between pixel electrode and the drain of the switching device, and having planar upper surface], for

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the benefit of preventing the orientation of the liquid crystal molecules be disturbed at an area corresponding to the contact hole, [col. 32, lines 9-16 and lines 29-35]. In fact, through out Zhang et al invention, the filler that fills the contact hole could be any material. The main thing is that the filler that fills the contact hole makes the upper surface of the contact hole flat in order to prevent the orientation of the liquid crystal molecules be disturbed at an area corresponding to the contact hole. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the filler formed of transparent conductive material or the same material as the pixel electrode, and having a substantially planar upper surface for the benefit of preventing the orientation of the liquid crystal molecules be disturbed at an area corresponding to the contact hole.

Regarding claim 2, Sato lacks disclosure of the surface of the interlayer insulating film being planarized. However, it was well known to have the surface of the interlayer insulating film being planarized for the benefit of flattening or leveling the substrate, as evidenced by Zhang et al, [fig. 16]. Therefore, at the time the invention was made, it would have been obvious to a person of ordinary skill in the art to have the surface of the interlayer insulating film being planarized for the benefit of flattening or leveling the substrate.

Regarding claim 12, Sato et al discloses the data lines including main line portions which extend above the scanning lines so as to intersect the scanning lines; a counter electrode (21) facing the plurality of pixel electrodes (9a) being formed on a

counter substrate (20) disposed to face the substrate; convex portions being formed in regions which are to be gaps between the pixel electrodes, [fig. 17].

Even though Sato lacks disclosure of the overhang portions, which overhang from the main line portion along the scanning line, wherein the overhang portions including a shielding layer, it would have been obvious to one ordinary skill in the art to have the overhang portions including a shielding layer for blocking the light that might reflect from the scanning line, and therefore preventing the deterioration of the image display. Therefore, at the time the invention was made, it would have been obvious to one ordinary skill in the art to have the overhang portions along the scanning line including a shielding layer for blocking the light that might reflect from the scanning line, and therefore preventing the deterioration of the image display.

Sato further lacks disclosure of a first pixel electrode group inversely driven in a first period and a second pixel electrode group inversely driven in a second period complementary to the first period. However, it was an intended use limitation and therefore does not patentably distinguish the invention.

Regarding claim 13, since claim 13 included limitation "the convex portions have gentle surface step differences caused by removing the planarized films formed on the convex portions by an etching process and causing the surface of the convex portion exposed after removing the planarized films to recede", it makes the claim become a product-by-process claim, [MPEP 2113]. Since the process limitation does not affect the structure of the device, claim 13 is examined as the product claim itself, and therefore, claim 13 is met the discussion regarding claim 12 rejection above.

Regarding claim 3, Sato discloses another contact hole (83) being formed in another interlayer insulating film (41, 42), and the entire region inside the other contact hole being filled with the filler, [fig. 17].

Regarding claim 6, Sato discloses a coating member (ITO material) being formed on the inner surface of the contact hole (85), and the filler (16) being formed on the coating member, [figs. 3, 17; and considered ITO material of pixel electrode 9a as a coating member].

Regarding claim 8, Sato discloses the contact hole being formed in light-shielding regions corresponding to a position in which the scanning line and the data line is formed, [fig. 17].

Regarding claim 11, Sato discloses a relay layer (71a') being electrically connected between one of the pair of electrodes constituting the storage capacitor and the pixel electrode, [fig. 17].

Claim 15 is met the discussion regarding claim 1 rejection above.

Claim 16 is met the discussion regarding claim 1 rejection above, and also see fig. 18.

Response to Arguments

Applicant's arguments with respect to claims 1-13 and 15-17 have been considered but are moot in view of the new ground(s) of rejection.

Contact Information

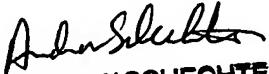
Any inquiry concerning this communication or earlier communications from the examiner should be directed to (Nancy) Thanh-Nhan P. Nguyen whose telephone number is 571-272-1673. The examiner can normally be reached on Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 571-272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

(Nancy) Thanh-Nhan P Nguyen
Examiner
Art Unit 2871

TN


ANDREW SCHECHTER
PRIMARY EXAMINER